SECTION II—CLAIMS

1. (Original) A method, comprising:

applying a gain to an analog signal representative of a barcode based on a predetermined amplitude for the analog signal;

determining an amplitude of a first frequency portion of the analog signal; and

determining an amplitude of a second frequency portion of the analog signal.

2. (Original) The method of claim 1, further comprising determining that frequencies in the first frequency portion are lower than frequencies in the second frequency portion.

3. (Original) The method of claim 1, further comprising determining that frequencies in the first frequency portion are higher than frequencies in the second frequency portion.

4. (Original) The method of claim 1, further comprising determining that frequencies in the first frequency portion are within frequencies in the second frequency portion.

5. (Original) The method of claim 1, further comprising determining that the amplitude of the second frequency portion of the analog signal is less than the amplitude of a first frequency portion of the analog signal.

6. (Original) The method of claim 5, further comprising applying a second gain to the analog signal based on the amplitude of the first frequency portion of the analog signal.

7. (Original) The method of claim 5, further comprising applying a second gain to the analog signal based on the amplitude of the second frequency portion of the analog signal.

8. (Original) The method of claim 1, further comprising determining that the amplitude of the first frequency portion of the analog signal is approximately equal to the amplitude of the second frequency portion of the analog signal.

9. (Original) The method of claim 8, further comprising applying a second gain to the analog signal based on the predetermined amplitude for the analog signal.

10. (Original) The method of claim 8, further comprising:

determining that a noise filter is OFF;

determining that a read rate is less than a predetermined value; and

turning the noise filter ON in response to the read rate being less than the predetermined value.

11. (Original) The method of claim 10, further comprising:

determining that the read rate increased; and

leaving the noise filter ON in response to the increased read rate.

12. (Original) The method of claim 10, further comprising:

determining that the read rate decreased; and

turn the noise filter OFF in response to the decreased read rate.

13. (Original) An apparatus, comprising:

logic to apply a first gain to an analog signal representative of a barcode based on a predetermined amplitude for the analog signal, to determine an amplitude of a first frequency portion of the analog signal, and to determine an amplitude of a second frequency portion of the analog signal.

14. (Original) The apparatus of claim 13, wherein frequencies in the first frequency portion are higher than frequencies in the second frequency portion.

15. (Original) The apparatus of claim 13, wherein frequencies in the first frequency portion are within frequencies in the second frequency portion.

16. (Original) The apparatus of claim 13, wherein the logic is further to determine that the amplitude of the second frequency portion of the analog signal is less than the amplitude of a first frequency portion of the analog signal.

17. (Original) The apparatus of claim 13, further wherein frequencies in the first frequency portion are lower than frequencies in the second frequency portion.

18. (Original) The apparatus of claim 17, wherein the logic is further to apply a second gain to the analog signal based on the amplitude of the first frequency portion of the analog signal.

19. (Original) The apparatus of claim 17, wherein the logic is further to apply a second gain to the analog signal based on the amplitude of the second frequency portion of the analog signal.

20. (Original) The apparatus of claim 13, wherein the logic is further to determine that the amplitude of the first frequency portion of the analog signal is approximately equal to the amplitude of the second frequency portion of the analog signal.

21. (Original) The apparatus of claim 20, wherein the logic is further to apply a second gain to the analog signal based on the predetermined amplitude for the analog signal.

22. (Original) The apparatus of claim 20, wherein the logic is further to determine that a noise filter is OFF, to determine that a read rate is less than a predetermined value, and to turn the noise filter ON in response to the read rate being less than the predetermined value.

23. (Original) The apparatus of claim 22, wherein the logic is further to determine that the read rate increased and leaving the noise filter ON in response to the increased read rate.

24. (Original) The apparatus of claim 22, wherein the logic is further to determine that the read rate decreased and to turn the noise filter OFF in response to the decreased read rate.

25. (Original) A method, comprising:

receiving at a first gain element and a second gain element a gain signal, the gain signal based on a predetermined amplitude for an analog signal representative of a barcode, the first gain element matched to the second gain element;

generating a linear response to the gain signal using the first and the second gain elements;

applying the analog signal to a positive input of an operational amplifier; and

applying the linear response to the gain signal to a negative input of the operational amplifier.

26. (Original) The method of claim 25, further comprising buffering the gain signal before receiving it at the gate of the first gain element and the second gain element.

27. (Original) The method of claim 25, further comprising filtering the analog signal before receiving it at the operational amplifier.

28. (Original) A method, comprising:

generating a first value representative of the amplitude of a first frequency portion of an analog signal representative of a barcode; and

generating a second value representative of the amplitude of a second frequency portion of the analog signal.

29. (Original) The method of claim 28, further comprising applying a gain to the analog signal based on the first value and/or the second value.

30. (Original) The method of claim 28, further comprising determining that frequencies in the first frequency portion are lower than frequencies in the second frequency portion.

31. (Original) The method of claim 28, further comprising determining that frequencies in the first frequency portion are higher than frequencies in the second frequency portion.

32. (Original) The method of claim 28, further comprising determining that the frequencies in the first frequency portion are within frequencies in the second frequency portion.

33. (Original) An apparatus, comprising:

a first gain element to receive a gain signal, the gain signal based on a predetermined amplitude for an analog signal representative of a barcode;

a second gain element to receive the gain signal, the first gain element matched to the second gain element, the combination of the first and the second gain elements to generate a linear response to the gain signal,

circuitry to apply the linear response to the gain signal.

34. (Original) The apparatus of claim 33, further comprising logic to buffer the gain signal before receiving it at the gate of the first gain element and the second gain element.

35. (Original) The apparatus of claim 33, wherein the logic is further to filter the analog signal before receiving it at the operational amplifier.

36. (Original) The apparatus of claim 33, wherein the first and/or the second gain element is a transistor.

37. (Original) The apparatus of claim 36, wherein the first and/or the second gain element is an FET.

38. (Original) The apparatus of claim 37, wherein the first and/or the second gain element is a JFET, a MOSFET, and/or a GaAs FET.

39. (Original) The apparatus of claim 36, wherein the first and/or the second gain element is a bipolar junction transistor (BJT).

40. (Original) The apparatus of claim 39, wherein the first and/or the second gain element is a heterojunction bipolar junction transistor (HBJT).

41. (Original) The apparatus of claim 33, wherein the first and/or the second gain element is a vacuum tube.

42. (Original) An apparatus, comprising:

a modulation transfer function detector to generate a first value representative of a first frequency portion of an analog signal representative of a barcode and a second value representative of a second frequency portion of the analog signal; and

a processor to determine a gain signal based on the first value, the second value, and/or a predetermined amplitude for the analog signal, the processor to apply the gain signal to gain control circuitry, the gain control circuitry to apply gain to the analog signal, the gain being a linear response to the gain signal.

43. (Original) The apparatus of claim 42, further comprising filter circuitry to allow a predetermined range of frequencies within the analog signal to pass and to prevent frequencies outside the predetermined range from passing.

44. (Original) The apparatus of claim 42, further comprising logic to digitize the analog signal.

45. (Original) A method, comprising:

receiving at a gain element a gain signal, the gain signal based on a predetermined amplitude for an analog signal representative of a barcode, the gain element having a response;

generating a linear response to the gain signal using a map of the gain element response;

applying the analog signal to a positive input of an operational amplifier; and

applying the linear response to the gain signal to a negative input of the operational amplifier.

46. (Original) The method of claim 45, further comprising buffering the gain signal before receiving it at the gate of the first transistor and the second transistor.

47. (Original) The method of claim 45, further comprising filtering the analog signal before receiving it at the operational amplifier.

48. (Original) An apparatus, comprising:

a gain element to receive a gain signal, the gain signal based on a predetermined amplitude for a first analog signal, the first analog signal being representative of a barcode, the gain element having a response; and

a map of the gain element response, the combination of the gain element response and the map of the gain element response to generate a linear response to the gain signal; and

circuitry to apply the linear response to the first analog signal to generate a second analog signal.

49. (Original) The apparatus of claim 48, further comprising logic to buffer the gain signal before receiving it at the gate of the first gain element and the second gain element.

50. (Original) The apparatus of claim 48, wherein the logic is further to filter the analog signal before receiving it at the operational amplifier.

51. (Original) The apparatus of claim 48, wherein the gain element is a transistor.

52. (Original) The apparatus of claim 51, wherein the gain element is a FET.

53. (Original) The apparatus of claim 52, wherein the gain element is a JFET, a MOSFET, and/or a GaAs FET.

54. (Original) The apparatus of claim 51, wherein the gain element is a BJT.

55. (Original) The apparatus of claim 54, wherein the first and/or the second gain element is an HBJT.

56. (Original) The apparatus of claim 48, wherein the first and/or the second gain element is a vacuum tube.

57. (Original) A method, comprising:

determining that an amplitude of a first frequency portion of an analog signal representing a barcode is approximately equal to an amplitude of a second frequency portion of the analog signal;

determining that a noise filter is OFF;

determining that a read rate is less than a predetermined value; and

turning the noise filter ON in response to the read rate being less than the predetermined value.

58. (Original) The method of claim 57, further comprising:

determining that the read rate increased; and

leaving the noise filter ON in response to the increased read rate.

59. (Original) The method of claim 57, further comprising:

determining that the read rate decreased; and

turn the noise filter OFF in response to the decreased read rate.

60. (Original) An apparatus, comprising:

logic to determine that an amplitude of a first frequency portion of an analog signal representative of a barcode is approximately equal to an amplitude of a second frequency portion of the analog signal, to determine that a noise filter is OFF, to determine that a read rate is less than a predetermined value, and to turn the noise filter ON in response to the read rate being less than the predetermined value.

61. (Original) The apparatus of claim 60, further wherein frequencies in the first frequency portion are lower than frequencies in the second frequency portion.

62. (Original) The apparatus of claim 60, wherein frequencies in the first frequency portion are higher than frequencies in the second frequency portion.

63. (Original) The apparatus of claim 60, wherein frequencies in the first frequency portion are within frequencies in the second frequency portion.

64. (Original) The apparatus of claim 60, wherein the logic is further to determine that the read rate increased and to leave the noise filter ON in response to the increased read rate.

65. (Original) The apparatus of claim 60, wherein the logic is further to determine that the read rate decreased and to turn the noise filter OFF in response to the decreased read rate.

66. (Original) An apparatus, comprising:

a first gain element and a second gain element matched to the first gain element to generate a linear response to a gain signal, the gain signal being based on a predetermined amplitude for a first analog signal, the first analog signal being representative of a barcode;

circuitry to apply the linear response to the first analog signal to generate a second analog signal;

circuitry to determine an amplitude of a first frequency portion of the second analog signal, and to determine an amplitude of a second frequency portion of the second analog signal; and

logic to determine that the amplitude of the first frequency portion is approximately equal to the amplitude of the second frequency portion to determine that a noise filter is OFF, to determine that a read rate is less than a predetermined value, and to turn the noise filter ON in response to the read rate being less than the predetermined value.

67. (Original) The apparatus of claim 66, wherein the first and/or the second gain element is a transistor.

68. (Original) The apparatus of claim 67, wherein the first and/or the second gain element is an FET.

69. (Original) The apparatus of claim 68, wherein the first and/or the second gain element is a JFET, a MOSFET, and/or a GaAs FET.

70. (Original) The apparatus of claim 67, wherein the first and/or the second gain element is a bipolar junction transistor (BJT).

71. (Original) The apparatus of claim 70, wherein the first and/or the second gain element is a heterojunction bipolar junction transistor (HBJT).

72. (Original) The apparatus of claim 66, wherein the first and/or the second gain element is a vacuum tube.

73. (Original) The apparatus of claim 66, further wherein frequencies in the first frequency portion are lower than frequencies in the second frequency portion.

74. (Original) The apparatus of claim 66, wherein frequencies in the first frequency portion are higher than frequencies in the second frequency portion.

75. (Original) The apparatus of claim 66, wherein frequencies in the first frequency portion are within frequencies in the second frequency portion.

76. (Original) The apparatus of claim 66, wherein the logic is further to determine that the amplitude of the second frequency portion of the analog signal is less than the amplitude of a first frequency portion of the analog signal.

77. (Original) The apparatus of claim 66, wherein the logic is further to apply a second gain to the analog signal based on the amplitude of the first frequency portion of the analog signal.

78. (Original) The apparatus of claim 66, wherein the logic is further to determine that the read rate increased and to leave the noise filter ON in response to the increased read rate.

79. (Original) The apparatus of claim 66, wherein the logic is further to determine that the read rate decreased and to turn the noise filter OFF in response to the decreased read rate.

80. (Original) An apparatus, comprising:

a gain element having a response;

a map of the gain element response, the combination of the gain element and the map of the gain element response to generate a linear response to a gain signal, the gain signal based on a predetermined amplitude for a first analog signal, the first analog signal being representative of a barcode;

circuitry to apply the linear response to the first analog signal to generate a second analog signal;

logic to determine an amplitude of a first frequency portion of the second analog signal, and to determine an amplitude of a second frequency portion of the second analog signal; and

logic to determine that the amplitude of the first frequency portion is approximately equal to the amplitude of the second frequency portion to determine that a noise filter is OFF, to determine that a read rate is less than a predetermined value, and to turn the noise filter ON in response to the read rate being less than the predetermined value.

81. (Original) The apparatus of claim 80, wherein the gain element is a transistor.

82. (Original) The apparatus of claim 81, wherein the gain element is an FET.

83. (Original) The apparatus of claim 82, wherein the gain element is a JFET, a MOSFET, and/or a GaAs FET.

84. (Original) The apparatus of claim 81, wherein the gain element is a bipolar junction transistor (BJT).

85. (Original) The apparatus of claim 84, wherein the gain element is a heterojunction bipolar junction transistor (HBJT).

86. (Original) The apparatus of claim 80, wherein the gain element is a vacuum tube.

87. (Original) The apparatus of claim 80, further wherein frequencies in the first frequency portion are lower than frequencies in the second frequency portion.

88. (Original) The apparatus of claim 80, wherein frequencies in the first frequency portion are higher than frequencies in the second frequency portion.

89. (Original) The apparatus of claim 80, wherein frequencies in the first frequency portion are within frequencies in the second frequency portion.

90. (Original) The apparatus of claim 80, wherein the logic is further to determine that the amplitude of the second frequency portion of the analog signal is less than the amplitude of a first frequency portion of the analog signal.

91. (Original) The apparatus of claim 80, wherein the logic is further to apply a second gain to the analog signal based on the amplitude of the first frequency portion of the analog signal.

92. (Original) The apparatus of claim 80, wherein the logic is further to determine that the read rate increased and to leave the noise filter ON in response to the increased read rate.

93. (Original) The apparatus of claim 80, wherein the logic is further to determine that the read rate decreased and to turn the noise filter OFF in response to the decreased read rate.

94. (Original) An apparatus, comprising:

logic to apply a first gain to an analog signal representative of a barcode based on a predetermined amplitude for the analog signal, to determine an amplitude of a first frequency portion of the analog signal, and to determine an amplitude of a second frequency portion of the analog signal; and

logic to determine that the amplitude of the first frequency portion is approximately equal to the amplitude of the second frequency portion to determine that a noise filter is OFF, to determine that a read rate is less than a predetermined value, and to turn the noise filter ON in response to the read rate being less than the predetermined value.

95. (Original) The apparatus of claim 94, further wherein frequencies in the first frequency portion are lower than frequencies in the second frequency portion.

96. (Original) The apparatus of claim 94, wherein frequencies in the first frequency portion are higher than frequencies in the second frequency portion.

97. (Original) The apparatus of claim 94, wherein frequencies in the first frequency portion are within frequencies in the second frequency portion.

98. (Original) The apparatus of claim 94, wherein the logic is further to determine that the amplitude of the second frequency portion of the analog signal is less than the amplitude of a first frequency portion of the analog signal.

99. (Original) The apparatus of claim 94, wherein the logic is further to apply a second gain to the analog signal based on the amplitude of the first frequency portion of the analog signal.

100. (Original) The apparatus of claim 94, wherein the logic is further to determine that the read rate increased and to leave the noise filter ON in response to the increased read rate.

101. (Original) The apparatus of claim 94, wherein the logic is further to determine that the read rate decreased and to turn the noise filter OFF in response to the decreased read rate.

102. (Original) An apparatus, comprising:

a first gain element and a second gain element matched to the first gain element to generate a linear response to a gain signal, the gain signal being based on a predetermined amplitude for a first analog signal, the first analog signal being representative of a barcode;

circuitry to apply the linear response to the first analog signal to generate a second analog signal; and

logic to determine an amplitude of a first frequency portion of at least a portion of the second analog signal, and to determine an amplitude of a second frequency portion of at least a portion of the second analog signal.

103. (Original) The apparatus of claim 102, wherein the first and/or the second gain element is a transistor.

104. (Original) The apparatus of claim 103, wherein the first and/or the second gain element is an FET.

105. (Original) The apparatus of claim 104, wherein the first and/or the second gain element is a JFET, a MOSFET, and/or a GaAs FET.

106. (Original) The apparatus of claim 103, wherein the first and/or the second gain element is a bipolar junction transistor (BJT).

107. (Original) The apparatus of claim 106, wherein the first and/or the second gain element is a heterojunction bipolar junction transistor (HBJT).

108. (Original) The apparatus of claim 102, wherein the first and/or the second gain element is a vacuum tube.

109. (Original) The apparatus of claim 102, further wherein frequencies in the first frequency portion are lower than frequencies in the second frequency portion.

110. (Original) The apparatus of claim 102, wherein frequencies in the first frequency portion are higher than frequencies in the second frequency portion.

111. (Original) The apparatus of claim 102, wherein frequencies in the first frequency portion are within frequencies in the second frequency portion.

112. (Original) The apparatus of claim 102, wherein the logic is further to determine that the amplitude of the second frequency portion of the analog signal is less than the amplitude of a first frequency portion of the analog signal.

113. (Original) The apparatus of claim 102, wherein the logic is further to apply a second gain to the analog signal based on the amplitude of the first frequency portion of the analog signal.

114. (Original) The apparatus of claim 102, wherein the logic is further to determine that the amplitude of the first frequency portion of the analog signal is approximately equal to the amplitude of the second frequency portion of the analog signal.

115. (Original) An apparatus, comprising:

a first gain element and a second gain element matched to the first gain element to generate a linear response to a gain signal, the gain signal being based on a predetermined amplitude for a first analog signal, the first analog signal being representative of a barcode;

circuitry to apply the linear response to the first analog signal to generate a second analog signal; and

logic to determine an amplitude of a first frequency portion of the second analog signal is approximately equal to an amplitude of a second frequency portion of the second

analog signal, to determine that a noise filter is OFF, to determine that a read rate is less than a predetermined value, and to turn the noise filter ON in response to the read rate being less than the predetermined value.

116. (Original) The apparatus of claim 115, wherein the first and/or the second gain element is a transistor.

117. (Original) The apparatus of claim 116, wherein the first and/or the second gain element is an FET.

118. (Original) The apparatus of claim 117, wherein the first and/or the second gain element is a JFET, a MOSFET, and/or a GaAs FET.

119. (Original) The apparatus of claim 116, wherein the first and/or the second gain element is a bipolar junction transistor (BJT).

120. (Original) The apparatus of claim 119, wherein the first and/or the second gain element is a heterojunction bipolar junction transistor (HBJT).

121. (Original) The apparatus of claim 115, wherein the first and/or the second gain element is a vacuum tube.

122. (Original) The apparatus of claim 115, wherein the logic is further to determine that the read rate increased and to leave the noise filter ON in response to the increased read rate.

123. (Original) The apparatus of claim 115, wherein the logic is further to determine that the read rate decreased and to turn the noise filter OFF in response to the decreased read rate.

124. (Original) An apparatus, comprising:

a gain element having a response;

a map of the gain element response, the combination of the gain element and the map of the gain element response to generate a linear response to a gain signal, the gain signal based on a predetermined amplitude for a first analog signal, the first analog signal being representative of a barcode;

circuitry to apply the linear response to the first analog signal to generate a second analog signal; and

logic to determine an amplitude of a first frequency portion of at least a portion of the second analog signal, and to determine an amplitude of a second frequency portion of at least a portion of the second analog signal.

125. (Original) The apparatus of claim 124, wherein the gain element is a transistor.

126. (Original) The apparatus of claim 125, wherein the gain element is an FET.

127. (Original) The apparatus of claim 126, wherein the gain element is a JFET, a MOSFET, and/or a GaAs FET.

128. (Original) The apparatus of claim 125, wherein the gain element is a bipolar junction transistor (BJT).

129. (Original) The apparatus of claim 128, wherein the gain element is a heterojunction bipolar junction transistor (HBJT).

130. (Original) The apparatus of claim 124, wherein the gain element is a vacuum tube.

131. (Original) The apparatus of claim 124, further wherein frequencies in the first frequency portion are lower than frequencies in the second frequency portion.

132. (Original) The apparatus of claim 124, wherein frequencies in the first frequency portion are higher than frequencies in the second frequency portion.

133. (Original) The apparatus of claim 124, wherein frequencies in the first frequency portion are within frequencies in the second frequency portion.

134. (Original) The apparatus of claim 124, wherein the logic is further to determine that the amplitude of the second frequency portion of the analog signal is less than the amplitude of a first frequency portion of the analog signal.

135. (Original) The apparatus of claim 124, wherein the logic is further to apply a second gain to the analog signal based on the amplitude of the first frequency portion of the analog signal.

136. (Original) The apparatus of claim 124, wherein the logic is further to determine that the amplitude of the first frequency portion of the analog signal is approximately equal to the amplitude of the second frequency portion of the analog signal.

137. (Original) An apparatus, comprising:

a gain element having a response;

a map of the gain element response, the combination of the gain element and the map of the gain element response to generate a linear response to a gain signal, the gain signal based on a predetermined amplitude for a first analog signal, the first analog signal being representative of a barcode;

circuitry to apply the linear response to the first analog signal to generate a second analog signal; and

logic to determine an amplitude of a first frequency portion of the second analog signal is approximately equal to an amplitude of a second frequency portion of the second analog signal, to determine that a noise filter is OFF, to determine that a read rate is less than a predetermined value, and to turn the noise filter ON in response to the read rate being less than the predetermined value.

138. (Original) The apparatus of claim 137, wherein the gain element is a transistor.

139. (Original) The apparatus of claim 138, wherein the gain element is an FET.

140. (Original) The apparatus of claim 139, wherein the gain element is a JFET, a MOSFET, and/or a GaAs FET.

141. (Original) The apparatus of claim 138, wherein the gain element is a bipolar junction transistor (BJT).

142. (Original) The apparatus of claim 141, wherein the gain element is a heterojunction bipolar junction transistor (HBJT).

143. (Original) The apparatus of claim 137, wherein the gain element is a vacuum tube.

144. (Original) The apparatus of claim 137, wherein the logic is further to determine that the read rate increased and to leave the noise filter ON in response to the increased read rate.

145. (Original) The apparatus of claim 137, wherein the logic is further to determine that the read rate decreased and to turn the noise filter OFF in response to the decreased read rate.